

CHAPTER 209
PRESSURE VESSELS

[Prior to 9/24/86, Labor, Bureau of[530] Ch 209]
[Prior to 1/14/98, see Labor Services[347] Ch 48]

875—209.1(89) New installations. This rule applies to pressure vessels, except those exempted by Iowa Code section 89.4(2).

209.1(1) *Installations—July 1, 1983, to December 31, 1988.* Pressure vessels installed shall be designed, manufactured, installed, inspected, and stamped in conformity with the applicable sections of the ASME Boiler and Pressure Vessel Code (1983) and the National Board registration requirements.

209.1(2) *Installations—January 1, 1989, to December 31, 1990.* Pressure vessels installed shall be designed, manufactured, installed, inspected, and stamped in conformity with the applicable sections of the ASME Boiler and Pressure Vessel Code (1986) with 1988 addenda and the National Board registration requirements.

209.1(3) *Installations—January 1, 1991, to June 30, 1996.* Pressure vessels installed shall be designed, manufactured, installed, inspected, and stamped in conformity with the applicable sections of the ASME Boiler and Pressure Vessel Code (1989) with 1990 addenda and the National Board registration requirements.

209.1(4) *Installations—July 1, 1996, to December 31, 1997.* Pressure vessels, including reinstalled pressure vessels, installed between July 1, 1996, and December 31, 1997, shall be designed, manufactured, installed, inspected, and stamped in accordance with the requirements of ASME Code for Boilers and Pressure Vessels Section VIII (1995) or the requirements of recognized national or international standards such as DIN, BSI, ASME, JIS, or CNS. Only national and international standards acceptable to the division may be utilized. Pressure vessels installed and reinstalled after July 1, 1996, must be inspected by a National Board commissioned inspector and be registered with the National Board. The pressure vessels must comply with the requirements of ANSI/ASME CSD-1 (1995), as applicable.

209.1(5) *Installations after January 1, 1998.* After January 1, 1998, pressure vessels installed, including reinstalled pressure vessels, shall be designed, manufactured, installed, inspected, and stamped in accordance with the requirements of ASME Code for Boilers and Pressure Vessels Section VIII (1995) or the requirements of recognized national or international standards such as DIN, BSI, ASME, JIS, or CNS. Only national and international standards acceptable to the division may be utilized. Pressure vessels installed and reinstalled after January 1, 1998, must be inspected by a National Board commissioned inspector and be registered with the National Board. The pressure vessels must comply with the requirements of ANSI/ASME CSD-1 (1995 with 1997 addenda) as applicable.

875—209.2(89) Existing installations.

209.2(1) *Maximum allowable working pressure (code stamped).* The maximum allowable working pressure for pressure vessels shall be determined in accordance with the applicable provisions of the ASME Code or API-ASME Code under which they were constructed and stamped.

209.2(2) Maximum allowable working pressure (noncode stamped).

a. The maximum allowable working pressure on the shell of pressure vessels not covered by sub-rule 209.2(1) shall be determined by the strength of the weakest course computed from the thickness of the plate, the tensile strength of the plate, the efficiency of the longitudinal joint, the inside diameter of the course and the factor of safety set by this subrule.

TStE
RFS = Maximum allowable working pressure, psig.

Where:

TS = Ultimate tensile strength of shell plate(s), psig. When the tensile strength of a steel plate(s) is unknown, it shall be taken as 55,000 psig for temperatures not exceeding 650 degrees F.

t = Minimum thickness of shell plates of the weakest course, in inches.

E = Efficiency of longitudinal joint. For riveted joints, use ASME Code, Section 1 (1971). For fusion-welded and brazed joints, use the following table:

Single lap welded	40
Double lap welded	60
Single butt welded	60
Double butt welded	75
Forge welded	70
Brazed steel	80

R = Inside radius of the weakest course of shell or drum in inches, provided the thickness does not exceed 10 percent of the radius. If the thickness is over 10 percent of the radius, the outer radius shall be used.

FS = Factor of safety shall be four.

b. External pressure. The maximum allowable working pressure for noncode pressure vessels subjected to external or collapsing pressure shall be determined by the ASME Code, Section VIII, Divisions 1, 2 and 3 (1995 with 1997 addenda).

209.2(3) Factor of safety. The factor of safety shall be increased by the inspector if the conditions and safety of the pressure vessel demand it.

209.2(4) End closures. The maximum allowable working pressure permitted for formed heads under pressure shall be determined by using the formulas in ASME Code, Section VIII, Divisions 1, 2 and 3 (1995 with 1997 addenda).

209.2(5) Inspection of inaccessible parts. Where in the opinion of this inspector, as a result of conditions disclosed at the time of inspection, it is advisable to remove the interior or exterior lining, covering, or brickwork to expose certain parts of the vessel not normally visible, the owner or user shall remove such material to permit proper inspection and thickness measurement of any part of the vessel. Nondestructive examination is acceptable.

209.2(6) Safety appliances. Each pressure vessel shall be protected by such safety and relief valves and indicating and controlling devices as will ensure its safe operation. Valves shall not readily be rendered inoperative. The relieving capacity of safety valves shall be such as to prevent a rise of pressure in the vessel of more than 10 percent above maximum allowable working pressure, taking into account the effect of static head. Safety valve discharges shall be carried to a safe place.

209.2(7) *Repairs and renewals.* Whenever replacement or repairs are made to fittings and appliances the work must comply with the requirements for new installations.

These rules are intended to implement Iowa Code chapter 89.

[Filed 7/15/59]

[Filed 5/6/83, Notice 3/30/83—published 5/25/83, effective 7/1/83]

[Filed emergency 6/13/83—published 7/6/83, effective 7/1/83]

[Filed emergency 9/5/86—published 9/24/86, effective 9/24/86]

[Filed 3/17/89, Notice 9/21/88—published 4/5/89, effective 5/10/89]

[Filed 10/25/91, Notice 7/10/91—published 11/13/91, effective 1/1/92]

[Filed 5/16/96, Notice 11/22/95—published 6/5/96, effective 8/1/96]

[Filed emergency 12/26/97 after Notice 11/19/97—published 1/14/98, effective 1/1/98]

CHAPTERS 210 to 214

Reserved